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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
08/988,246	12/01/1997	SEBASTIEN RAOUX	AM1771-4-T19	7250
32588	7590	04/21/2004	EXAMINER	
APPLIED MATERIALS, INC. 2881 SCOTT BLVD. M/S 2061 SANTA CLARA, CA 95050			ZERVIGON, RUDY	
			ART UNIT	PAPER NUMBER

1763

DATE MAILED: 04/21/2004

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Paper No. 20040412

Application Number: 08/988,246  
Filing Date: December 01, 1997  
Appellant(s): RAOUX ET AL.

\_\_\_\_\_  
Chun-Pok Leung  
For Appellant

**EXAMINER'S ANSWER**

**MAILED**

**APR 21 2004**

**GROUP 1700**

This is in response to the appeal brief filed February 5, 2004.

**(1) *Real Party in Interest***

A statement identifying the real party in interest is contained in the brief.

**(2) *Related Appeals and Interferences***

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

**(3) *Status of Claims***

The statement of the status of the claims contained in the brief is incorrect. A correct statement of the status of the claims is as follows:

Claims 3-6, 11-14, 16, 19, 20, 23, 24, and 26-30 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-5 of U.S. Patent No. 6,098,568 in view of Patrick et al (U.S.Pat. 5,474,648). This rejection is set forth in prior Office Action, Paper No. 42.

Claims 3-6, 11-14, 16, 19, 20, 23, 24, and 26-30 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-6 of U.S. Patent No. 6,041,734 in view of Patrick et al (U.S.Pat. 5,474,648). This rejection is set forth in prior Office Action, Paper No. 42.

Claims 3, 4, 6, 11-14, 16, 19, 20, 24, 26, 28, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arami et al (USPat. 6,014,943) in view of Patrick et al (USPat. 5,474,648). This rejection is set forth in prior Office Action, Paper No. 42.

Claims 5, 27, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arami et al (USPat. 6,014,943) in view of Patrick et al (USPat. 5,474,648), as applied to claims 3, 4, 6, 11-

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14, 16, 19, 20, 24, 26, 28, and 29 above, and further in view of Boys et al (USPat. 4,500,408).

This rejection is set forth in prior Office Action, Paper No. 42.

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arami et al (USPat. 6,014,943) in view of Patrick et al (USPat. 5,474,648), as applied to claims 3, 4, 6, 11-14, 16, 19, 20, 24, 26, 28, and 29 above, and further in view of Yamagata et al (USPat. 5,362,358). This rejection is set forth in prior Office Action, Paper No. 42.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Invention**

The summary of invention contained in the brief is correct.

**(6) Issues**

The appellant's statement of the issues in the brief is correct.

**(7) Grouping of Claims**

The appellant's statement in the brief that certain claims do not stand or fall together is not agreed with because the claims are not separately patentable.

**(8) Claims Appealed**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(9) Prior Art of Record**

6,014,943	ARAMI et al	1-2000
5,474,648	PATRICK et al	12-1995
4,500,408	BOYS et al	2-1985

5,362,358

YAMAGATA et al

11-1994

**(10) Grounds of Rejection**

The following grounds of rejection are applicable to the appealed claims:

Claims 3-6, 11-14, 16, 19, 20, 23, 24, and 26-30 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-5 of U.S. Patent No. 6,098,568 in view of Patrick et al (U.S.Pat. 5,474,648). This rejection is set forth in prior Office Action, Paper No. 42.

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**(11) Response to Arguments**

Applicant states (last line page 8), that the Examiner "concedes that Patrick et al does not teach the first and second impedance probes". In no way has the Examiner ever conceded Applicant's assertion. Directly contradicting Applicant's position, as set forth in the Final Office Action, Patrick teaches:

"

...an impedance monitor (202, "RF Parameter Sensor", Figure 2A; column 7, lines 14-20) comprising a first impedance probe electrically coupled to an electrode to measure the impedance at the electrode. The monitor further measures the voltage, current, and phase angle at the chamber electrode (items 112 and 114; column 6, line 64), and measures the "impedance of the plasma chamber electrode" (column 3, lines 64-67).

"

As such, the Examiner has clearly and precisely delineated where in the Patrick et al reference Patrick teaches an impedance monitor (202, "RF Parameter Sensor", Figure 2A; column 7, lines 14-20) comprising a first impedance probe electrically coupled to an electrode to measure the impedance at the electrode. This is not a concession.

Applicant further states "The power sensor in Patrick et al., however, does not measure the impedance at the LF electrode or at the HF electrode." (last line, page 8) And "The Examiner, however, fails to recognize that Patrick et al does not disclose even one impedance probes for measuring the impedance at an electrode. The Examiner has not identified any impedance probe in Patrick et al." (second paragraph, last two lines, page 10), yet, the Examiner has maintained

the clear demonstration in Patrick et al to the contrary. In particular, Patrick measures the impedance (column 3, lines 64-67) at the Patrick's electrode (112).

In response to applicant's argument (3<sup>rd</sup> paragraph, page 10) of the claim 16 rejection that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "a variable capacitor separate from the matching network", as claimed by claim 23, not 16) are not recited in the rejected claim 16. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicant then states, with respect to claim 16 it is assumed, that Yamagata does not teach "a variable capacitor electrically coupled to the chamber and controllably coupled to the processor wherein the processor adjusts a capacitance level of the variable capacitor to vary the impedance of the plasma in response to an output of the impedance monitor.", as claimed by claim 16. Claim 16 was rejected under 35 U.S.C. 103(a) as being unpatentable over Arami et al (USPat. 6,014,943) in view of Patrick et al (USPat. 5,474,648). This rejection is set forth in prior Office Action, Paper No. 42. There is NO reference to Yamagata in the rejection of claim 16. It was cited that Patrick teaches:

"

...variable capacitors and tuners (items 106 and 108; Figure 2A; Page 28, line 6 of Applicant's Specification) of a matching network (120, Fig.2A). Patrick's variable capacitor is electrically coupled to the one of the plasma electrodes (112) and controllably coupled to the processor (204, column 7, lines 4-12) wherein the processor adjusts a capacitance level of the variable capacitor to vary the impedance of the plasma in response to an output of the impedance monitor.

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“ column 3, line 61 – column 4, line 18.

Applicant states that “Patrick et al does not disclose two impedance probes electrically coupled to the two electrodes 112 and 114.” The Examiner agrees that Patrick et al does not teach two impedance probes electrically coupled to the two electrodes 112 and 114, however, the Examiner maintains his position that Patrick et al does disclose one impedance probe (202; Figure 2A; column 3, line 60 – column 4, line 1) electrically coupled to one electrode (112, Figure 2A). In summary, Applicant’s position that Patrick does not teach plural impedance probes is agreed by the Examiner. However, it is well established that the duplication of parts is obvious (*In re Harza* , 274 F.2d 669, 124 USPQ 378 (CCPA 1960) MPEP 2144.04). Added process control from providing plural impedance monitors would naturally result and would be obvious to one of ordinary skill as taught by Patrick (column 5, line 57 – column 6, line 34).

Applicant states that the present invention teaches new and unobvious results as a result of plural impedance monitors, as claimed, and specification teachings of measurements of “phase angle, and current intensities to analyze the effects of ion bombardment”.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., “phase angle, and current intensities to analyze the effects of ion bombardment”) are not recited in the rejected claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Further, Patrick et al also reproduces Applicant's measurement collection “In addition, the voltage, current, phase, and impedance of the plasma chamber electrode may also be measured..” (column 3, lines 64-67). As a result, Applicant's invention is not new and is obvious



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in view of Patrick et al as a result of Patrick's single impedance monitor (212; Figure 2A), as claimed, and specification teachings of measurements of "phase angle, and current intensities to analyze the effects of ion bombardment", as taught by Patrick et al.

In response to applicant's argument (page 12, "Claim group 2") that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). Further, it was well established that indeed Patrick teaches variably controlled (column 7, lines 10-13 – "Variable capacitors 106 and 108 may be automatically adjusted to obtain a substantially resistive termination for the RF generator 102.") capacitors (106, 108; Figure 2A) as demonstrated by Patrick et al (see variable capacitors 106, 108 of matching network 120, Figure 2A).

Applicant states that claim 23 is allowable because Arami does not teach a variable capacitor separate from the RF matching network. However, it was established in the Final Office action:

"

Neither Arami nor Patrick teach a variable capacitor separate from the matching network.

Yamagata teaches a variable capacitors (24, 26, Figure 6) separate from the matching network (22) of a plasma processing chamber.

...

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Motivation for Patrick to add a variable capacitor separate from the matching network of a plasma processing chamber as taught by Yamagata is discussed by Yamagata as drawn to controlling the amount of power applied to each of the electrodes in the plasma reactor (column 1, lines 45-47).

“

Further, it is noted, Yamagata teaches a controller (82; column 5, lines 32-38) that adjusts Yamagata's variable capacitors that are separate from a matching network in an effort to control the amount of power applied to each of the electrodes in the plasma reactor (column 1, lines 45-47) as taught by Yamagata.

Applicant states (page 14) that claims 13, 14, and 19 are allowable because none of the cited prior art teach “an impedance tuner is coupled in series to the substrate holder” yet, it was established that Patrick et al teaches variable capacitors and tuners (items 106 and 108; Figure 2A; Page 28, line 6 of Applicant's Specification) that impart a desired impedance to Patrick's electrode – “The values of coil 110 and variable capacitors 104 and 108 are selected for an appropriate impedance transformation between the RF generator 102 and the plasma chamber 104 electrodes 112 and 114.” (column 7, lines 7-13).

Applicant states (page 15), with respect to claim 28, that none of the references teach a processor to “adjust at least one of the high frequency RF power level of the power source..”. To the contrary, it has been established that Patrick et al clearly teaches said processor (204; Figure 2A) to “control the amount of power from the RF generator 102.” (column 7, lines 13-20).

Applicant further states that Arami does not teach capacitors in his matching circuits (32, 33; Figure 1). The Examiner agrees as in the Final Action, however, matching networks are well

known in the art as having capacitors as demonstrated by Patrick et al (see variable capacitors 106, 108 of matching network 120, Figure 2A). Thus Arami's inherent capacitors, as demonstrated by Patrick's matching network capacitors (106, 108; Figure 2A), are applicant's claimed "matching network capacitors". Further, the Examiner stated that it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the Patrick impedance monitor coupled to each of the low and high frequency electrodes of Arami et al. Thus, the addition and replication of Patrick's impedance monitor would meet applicant's claim limitation of Applicant's "the matching network" (of Arami) "has capacitors that are different" "than the variable capacitor" (of Patrick).

In response to applicant's argument that the capacitors of the matching network and the variable capacitor are "different", a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, i.e., achieving capacitance values that are different according to Patrick et al (106, 108), then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

Applicant states that the Examiner's statement of "Neither Arami nor Patrick teach a variable capacitor separate from the matching network." Is in the context of the rejection of claim 16. However, the Final Office action clearly cites the Examiner's statement in the context of the claim 23 rejection (Pages are misnumbered in the action).

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For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Rudy Zervigon  
Examiner  
Art Unit 1763

Rudy Zervigon  
April 14, 2004


Conferees

Gregory Mills (SPE 1763) – April 12, 2004

Glenn Caldarola (SPE 1764) – April 12, 2004

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